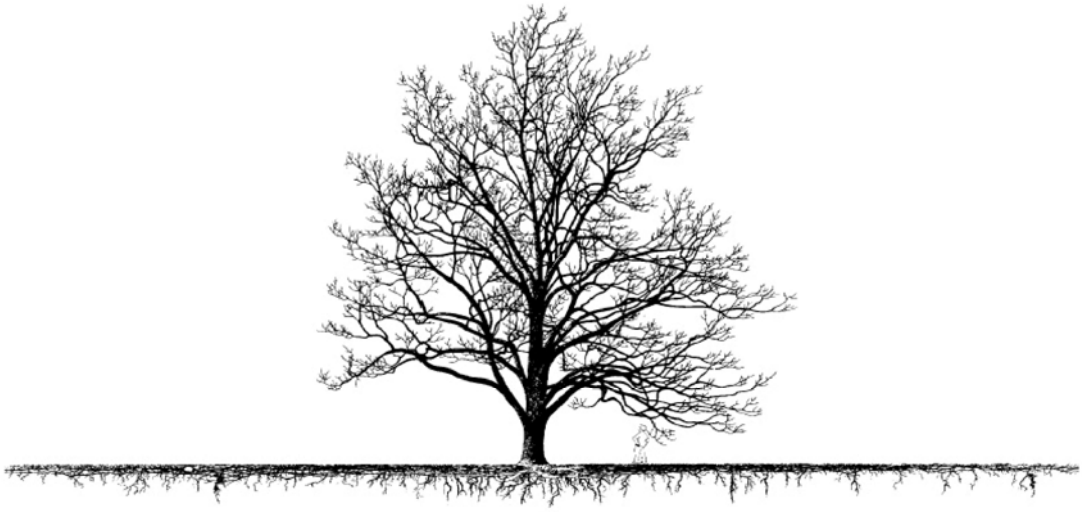
Louisa County Landscape Manual

Note: This is a guide for protecting existing trees, along with planting and maintaining new trees in the screening buffer. The recommendations in this pamphlet are not required by county code, but these standards will significantly increase the chances of preserving or installing a successful screening buffer. This manual is an administrative guide to facilitate the ordinance.



Outline:

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Tree Planting

Materials Selection

Use nursery-grown trees and shrubs; free of insects, diseases or mechanical injuries; having straight trunk(s) and a form characteristic of the species in conformance with American Standard for Nursery Stock, (ANSI Z60.1-1996).

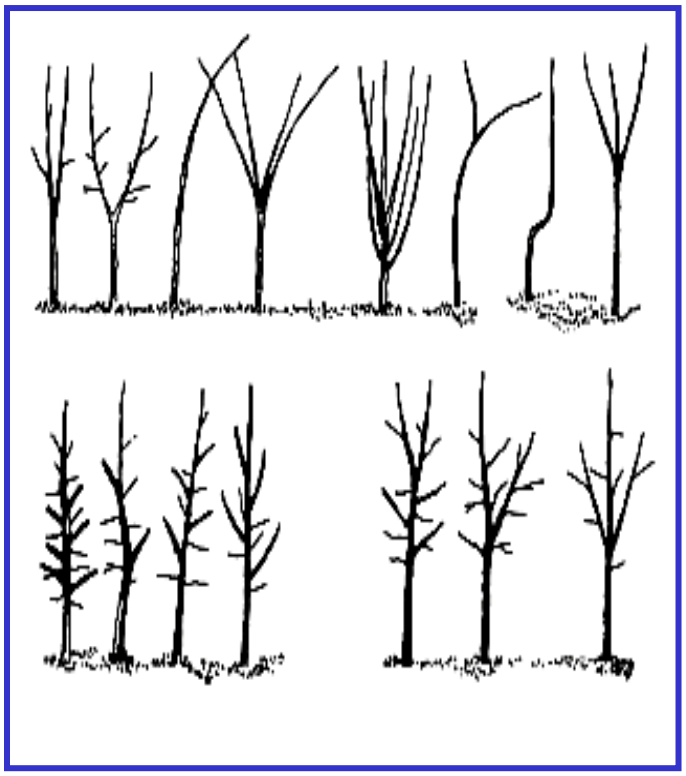
Select trees and shrubs well-adapted to conditions of individual planting sites (right tree for right spot concept). Poorly-sited plants are doomed from the start, no matter how carefully they're planted. Select small utility friendly trees for planting under or within 10 lateral feet of any overhead utility lines. Please select trees from the Louisa County Plant Material List.

Native trees and shrubs should be used whenever possible. Exotic (non-native) species known to be invasive should not be planted. Trees that are known to be resistant to attacks by disease or insects should be given preference over those known to be susceptible.

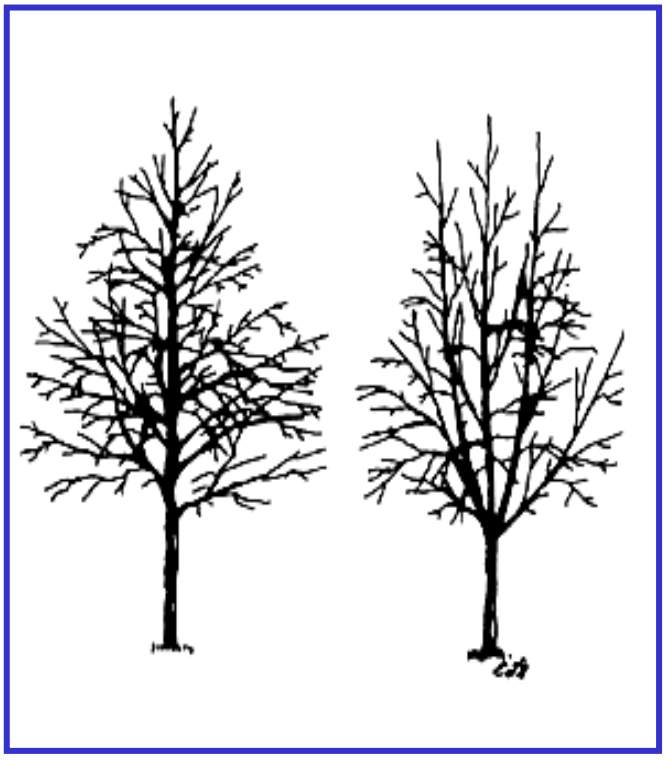
You can use ball and burlap trees (B & B) and/or container grown trees in the spring and fall of the year but from the end of June until early September of each year you should only use container grown trees. Planting B & B trees at less than ideal times of year can only be successful if extraordinary after planting care measures are taken including critical extra and consistent watering.

If trees are container grown, select trees that have containers with vertical ribs or a copper treatment on the interior container wall or air root pruned containers. These container modifications and treatments minimize circling root formation. The roots of container trees should be inspected for circling roots. These roots should be cut or pulled out to be planted straight in a larger hole.

Try to pick trees with good branching/trunk structure. Best quality trees have a dominant central leader or trunk up to the top of the canopy. Trees of lesser quality have two or more leaders. Major branches and trunks should not touch or cross. Branches should be less than 2/3 diameter of trunk. Permanent branches on large trees should be spaced 18 inches apart. Main branches on smaller trees should be 6 inches apart (see diagrams below).



Poor Quality Trunk Structure (top), Best Quality (lower left), Good Quality (lower right)



Good Quality Branching structure (left), **Poor Quality** (right)

Delivery and Temporary Storage

Shipping issues- Plants should be protected during delivery to prevent desiccation of leaves and roots. If delivered with an open bed truck or trailer, cover the plants with a trap while in transit. Be sure trees are irrigated just prior to shipping to help minimize desiccation. Do not allow closed trucks to remain standing in the sun unless they are air conditioned. Trees could be injured if the temperature inside the truck is maintained at more than 100 degrees Fahrenheit.

Root balls are fragile and should be handled carefully. Those in hard plastic containers or boxes are most resistant to abusive handling; those in soft, fabric containers and ball and burlap are most sensitive. Since picking the tree up by the trunk could strip the bark and break the roots, carry or lift it by the root ball. Never drop the tree because this will disrupt contact between fine roots and soil.

Holding area at planting site- Trees and shrubs should be planted on day of delivery. Trees that can not be planted for an hour or two, irrigate them as soon as they are inspected and unloaded from the truck. Trees left out and not planted can deteriorate in quality quickly when not properly cared for.

As soon as B&B trees arrive in the holding area, cover the sides of the root balls with soil, compost, mulch, saw dust or other organic matter to help prevent root desiccation. This also helps irrigation water penetrate the root ball. Do not cover the top since this could restrict the flow of irrigation into the root ball. Trees in containers should remain in the upright position so irrigation water can seep into the root ball. Group them close together to provide mutual shading of the root balls since direct sun hitting the side of the container often increases temperatures inside the root ball to lethal levels. Roots can die in a matter of hours so prompt action is essential. Unless trees will be stored in the complete shade, do not cover root balls or trees with any type of plastic since this could increase temperature to lethal levels. Irrigate trees in the holding area as they were in the nursery on a daily basis.

If trees can not be planted the day they arrive at the planting site, establish a holding area at the site. The holding area should be as shaded as possible and away from the wind and the root balls should be watered, and protected with soil, mulch, or other acceptable material. It should also have provisions for irrigation. This area should be setup prior to bringing trees to the planting site. Make sure to store the trees standing up and that the tops of the trees are not being hit by existing trees when the wind blows.

Trees and shrubs should not remain unplanted for more than two weeks.

Site Preparation

Before doing any digging for planting, contact "Miss Utility" at 800-552-7001 to identify underground utilities in the proposed planting area at least a week before you plan to plant.

Test soil drainage before planting. Dig a test hole as deep as your planting hole and fill with water. If water drains at a rate of less than one inch per hour, consider installing drainage to carry water away from the planting hole base, or moving or raising the planting site (berm construction).

If a "wet" site, consider using more water-tolerant species. For trees, try red maple, sycamore, bald cypress, willow oak, or river birch. For shrubs, try inkberry, redtwig dogwood and buttonbush. Avoid dogwoods, azaleas, boxwoods, Japanese hollies, yews and other plants that don't like "wet feet" where drainage is poor.

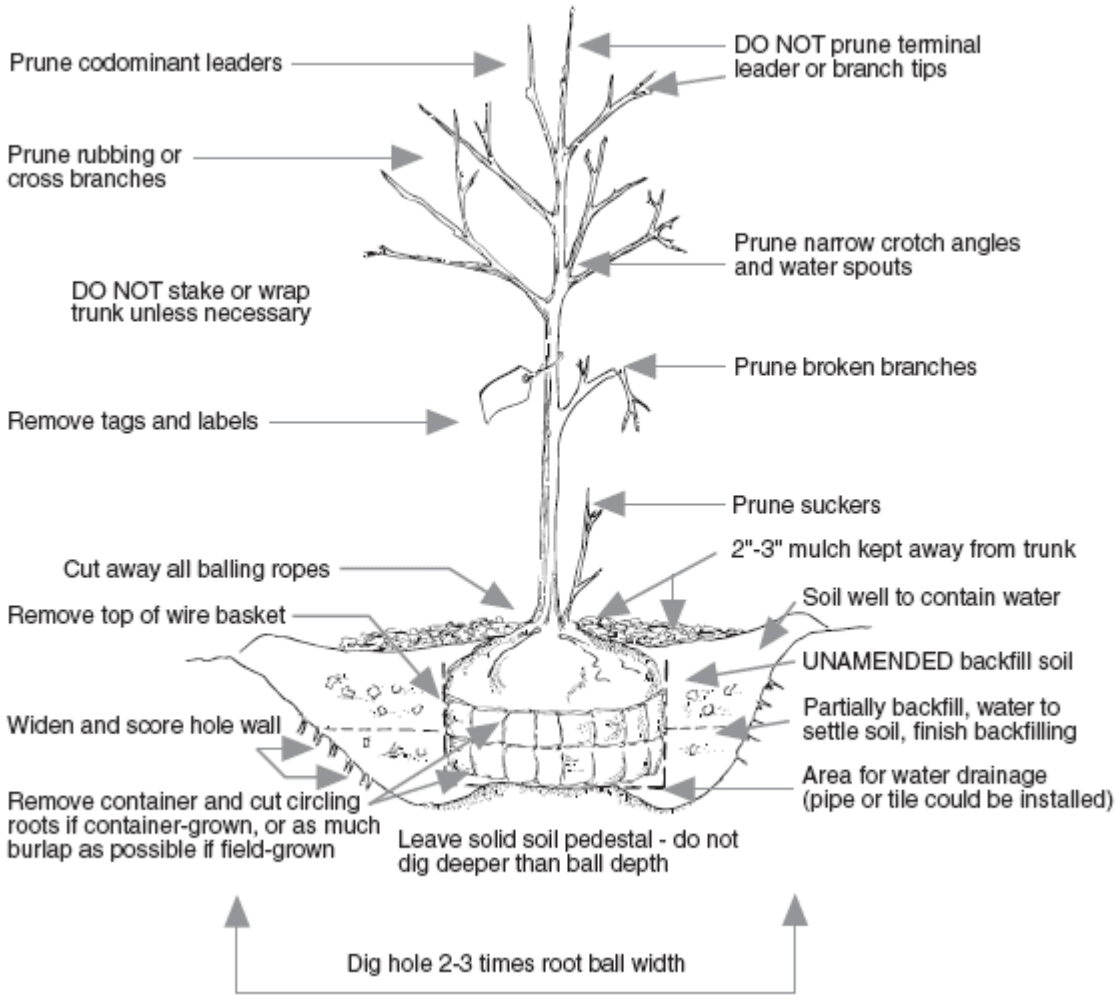
Examine soil for compaction before planting. If soils are compacted, consider replacement with a good loam soil, or incorporation of several inches of an organic material such as composted yard waste to a depth of at least 8 inches over the entire planting area. Do not incorporate small quantities of sand - compaction will increase and drainage decrease.

Dig shallow planting holes two to three times as wide as the root ball. In compacted soils, dig and loosen the soil three to five times as wide as the root ball. Wide, shallow holes encourage horizontal root growth that trees and shrubs naturally produce.

In well-drained soil, dig holes no deeper than the root ball. In poorly-drained heavy clay soil, dig holes one to two inches shallower than the root ball. The depth of the root ball is defined by height from the bottom of the root ball to the root flair (collar) and the top root at surface (see diagram below). This may sometimes require you to remove a few inches of soil from the top of the root ball to locate the root flair (collar on the trunk. Not doing this could cause you to plant the tree too deep and result in poor growth and eventual plant death. Cover the exposed root ball top with mulch after planting.

Don't dig holes deeper than root balls or put loose soil beneath roots because loose soil will compact over time, leaving trees and shrubs planted too deep. Widen holes near the soil surface where most root growth occurs. Score walls of machine-dug (auger, backhoe) holes to prevent glazing.

Tree and Shrub Preparation



Ball and Burlap Trees- Closely inspect the wrapping around root balls of B&B (balled and burlapped) trees and shrubs. Growers use many synthetic materials, as well as burlap treated to retard degradation (generally it will have a green tint), to wrap root balls. Many of these materials will not degrade. To insure root growth into surrounding soil, remove pinning nails or rope lacing, then cut away or drop the wrapping material to the bottom of the planting hole, backfilling over it.

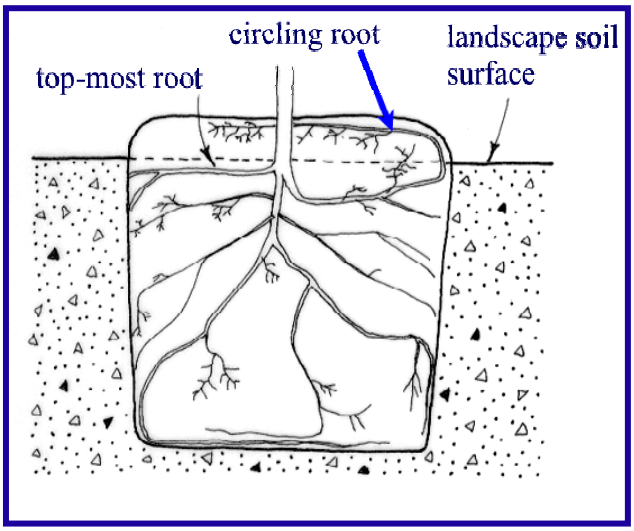
Wire baskets used to protect root balls degrade very slowly underground. Remove the top 8-12 inches of wire to keep equipment from getting caught in wire loops, and surface roots from being girdled.

If roots are circling around the root ball exterior or close to the stem, cut through the roots in a few places. Cutting helps prevent circling roots from eventually girdling the trunk.

Remove all rope, whether jute or nylon, from trunks. Again, degradation is slow or nonexistent, and ropes can girdle trunks and roots.

Remove all rope or netting from the branches and gently help release the crown to its natural shape, making sure no branches are unnaturally crossed. Prune any dead, damaged or broken branches. Do not prune to compensate for root loss.

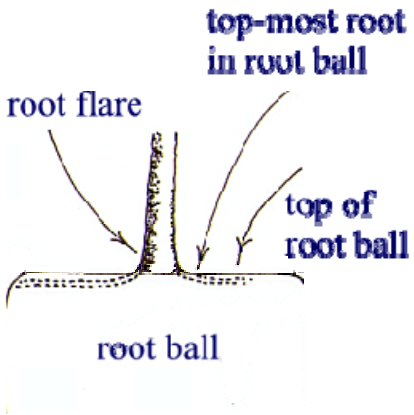
Container Grown Trees- Remove plastic containers from container-grown trees and shrubs. For plants in fiber pots, remove the pot entirely. Many fiber pots are coated to extend their shelf life, but this slows degradation below ground and retards root extension.



Remove some soil next to trunk to see where first root emerges. Cut or spread out any circling or kinked roots growing across main roots. Cutting helps prevent circling roots from eventually girdling the trunk. Position the top-most root about even with or slightly above the top of the landscape soil; plant even higher in soil that drains poorly (see example below).

Tree Planting

Place the tree in the hole checking to make sure the root flair (collar) is at or above the natural grade (see Root Flair diagram below). Orient the branch structure to best fit the site by rotating the tree in the hole.



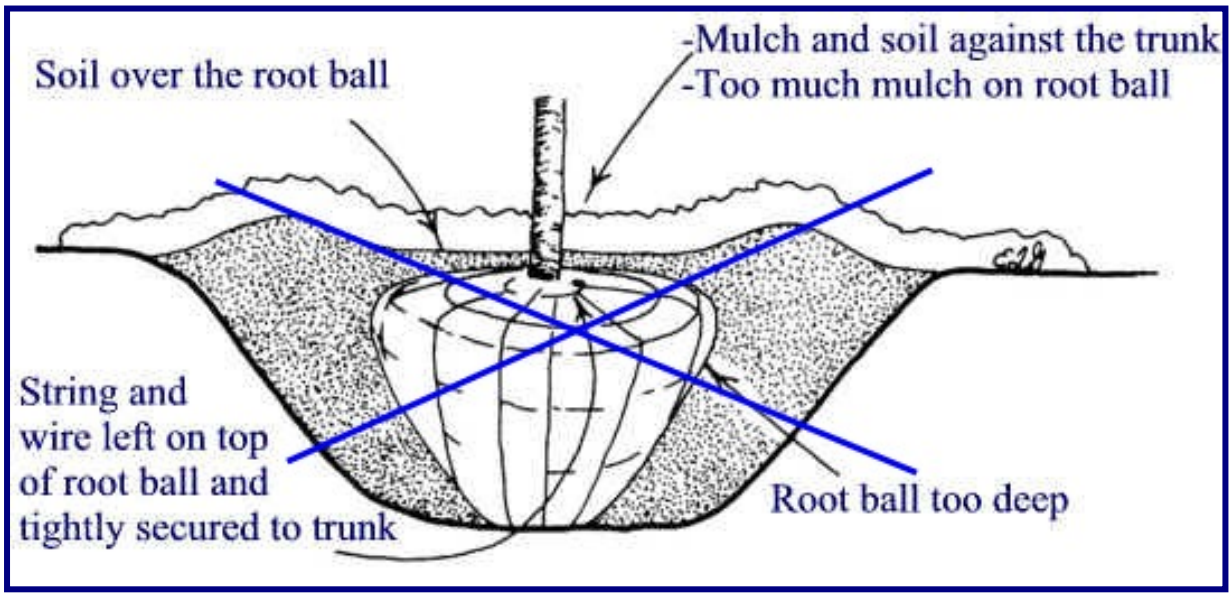
Backfill holes with existing unamended soil. Do not incorporate organic matter such as peat moss into backfill for individual planting holes. Differences in soil pore sizes will be created causing problems with water movement and root growth between the root ball, planting hole, and surrounding soil. Create a small berm around the outside of the planting area to help the tree capture rainfall.

Backfill half the soil, then water thoroughly to settle out air pockets. Finish backfilling and then water again. Cover any exposed root ball tops with mulch, not with soil.

Incorporate slow-release granular fertilizers into backfill soil to provide nitrogen, or if a soil test indicates a need for phosphorus or potassium. Avoid using fast-release agronomic fertilizers that can dehydrate tree roots. Use no more than 1 pound actual nitrogen per 1,000 ft. of planting hole surface. (Example - if using 18-6-12 fertilizer with a 5' diameter hole, incorporate 0.3 oz. per planting hole.)

Make sure to water each tree as you plant them.

What not to do:



Tree Care After Planting

Remove tags and labels from trees and shrubs to prevent girdling branches and trunks.

For pruning considerations during planting, see the **Pruning Section** below.

Mulch, but don't over mulch newly planted trees and shrubs. Three to four inches of mulch is best - less if a fine material, more if coarse. Use organic mulches (hardwood chips, shredded or chunk pine bark, pine straw, composts). Mulch from coniferous plants is best for conifers; hardwood mulch is probably best for hardwood plantings.

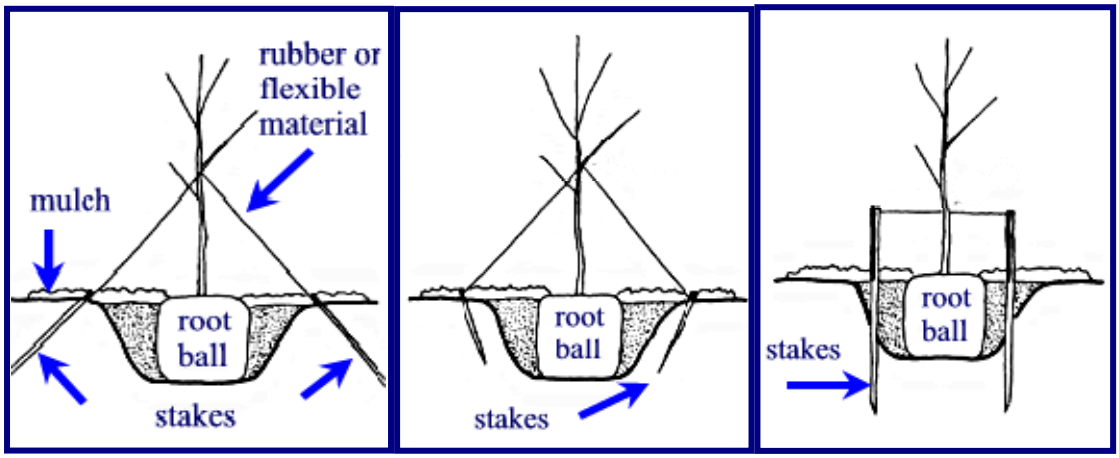
Conifer mulches could reduce the soil pH in some cases to levels undesirable for hardwoods. Hardwood mulches could increase the soil pH to levels undesirable for conifers.

Apply the mulch around the base of the tree in a flat saucer-like shape (like a bagel) not touching the trunk. It is better to mulch wide, not deep. Never pile mulch in a volcano-like manner against the trunk. This cuts off oxygen to roots, can keep vital irrigation and rain water out, can keep roots too wet in poorly drained soils, and can rot the trunk. (See mulch images below for more information.)

Keep mulch from touching tree trunks and shrub stems. This prevents disease and rodent problems if using organic mulches, and bark abrasion if using inorganic mulches.

Don't use black plastic beneath mulch around trees and shrubs because it blocks air and water exchange. For added weed control, use landscape fabrics that resist weed root penetration, keep this fabric away from the trunk or stems. Apply only one to two inches of mulch atop fabrics to prevent excess heat from building up under the fabric.

Only stake trees with large crowns, or those situated on windy sites or where people may push them over. Stake the tree for a maximum of six months past the first growing season. Allow trees a slight amount of flex rather than holding them rigidly in place. Do not use guying or attaching material that will damage the bark (such as bare wire). If wire must be used, protect the bark of the tree with rubber hose or plastic tubing. To prevent trunk girdling, remove all guying material six months past the first growing season. Examples:



Most trees should not have their trunks wrapped. Wrapping often increases insect, disease, and water damage to trunks. Thin-barked trees planted in spring or summer into hot or paved areas may benefit from wrapping if a white wrap is used. To avoid trunk girdling, do not attach wraps with wire, nylon rope, plastic ties, or electrical tape. If wraps must be used, remove within one year.

For protection against equipment (weed whackers) or animal damage, consider installing guards to protect the trunk. Be sure the guards are loose-fitting and permit air circulation.

Watering

Good follow-up watering helps promote root growth and tree survival. Drip irrigation systems such as tree gators and water reservoir devices can facilitate watering.

Watering during the first growing season is crucial. Container and balled-and-burlapped tree roots dry out faster than the soil around them, so it is particularly important to monitor their soil moisture. In the nursery, the roots of container and balled-and burlapped trees become concentrated in a small root ball, which is watered daily. After planting, the roots of these trees will eventually spread into surrounding soil. Until that happens, however, the trees continue to draw water mostly from their root ball. Consequently, if the soil near the trunk is dry, the trees need water.

Water heavily once a week for the first growing season unless there is one inch of rain that week (not including thunder storms). Use a drip irrigation system such as tree gators (www.treegator.com) or water reservoir devices or use a garden hose to slowly soak the soil. Always allow the water to reach the top of the berm built around the plant. This will provide deep water penetration and encourage widespread root development. Always check the soil moisture before watering to avoid over watering as this can kill the plant.

Tree Gator Watering Device

A simple way to check if a tree needs watering for a given week is to stick your finger through the mulch to the soil. If you feel moisture in the soil, wait until the following week before considering watering again.

Irrigate in drought the following summer through September and sometimes into October.

Follow-up Maintenance

Guying Material and Stakes

To prevent trunk girdling, remove all guying material and stakes after the first growing season.

If trunk wrap was used during tree installation, remove it within one year.

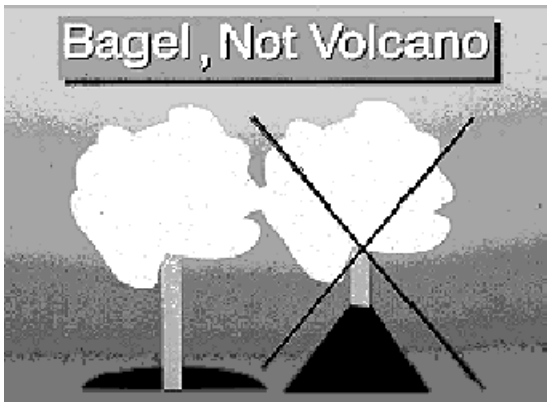
Fertilizer and Mulch

Apply mulch and fertilizer yearly (for the first three years). The best time to fertilize and apply new mulch is in the early spring before bud break. It is better to have a wide mulch area than to have a narrow and/or deep mulch area.

Apply slow-release granular fertilizers over the old mulch. Avoid using fast-release agronomic fertilizers that can dehydrate tree roots. Then apply three to four inches of new mulch. Apply the mulch around the base of the tree in a flat saucer-like shape, not like a volcano up the trunk. Keep mulch from touching tree trunks and shrub stems.

Don't Volcano Mulch:

Volcano Mulch (left), Correct Mulching (right)



Watering

You should not need to water the tree during the second and third growing seasons if using smaller diameter trees (less than 2.5 - 3 inches), but watering during an extended drought is especially important to increase plant vigor and survival.

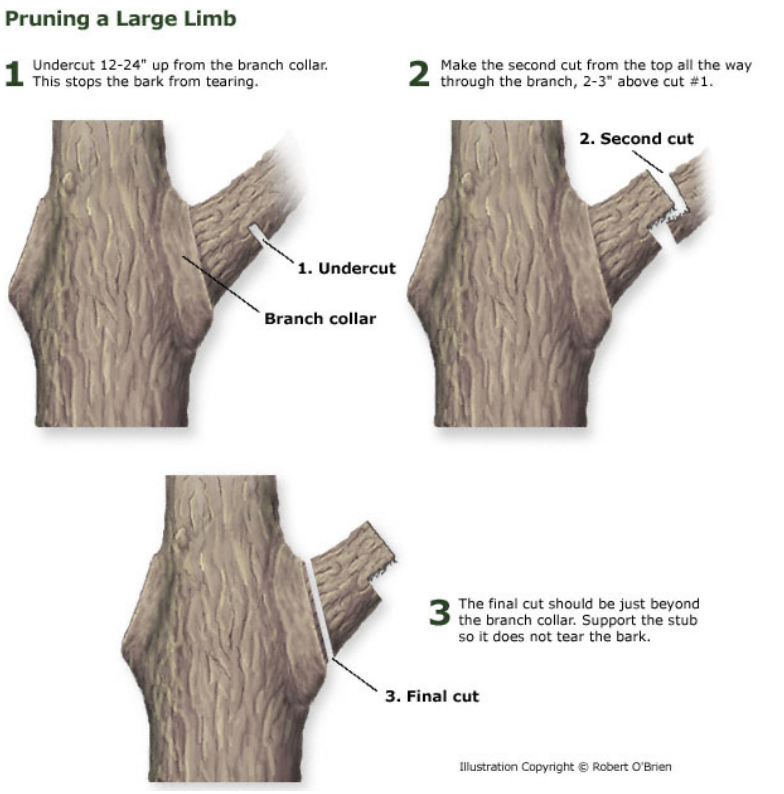
Pruning (see images below)

Pruning at planting- While pruning at planting appears to have little, if any, positive impact on transplant survival and growth after planting, **structural defects should be corrected.** This is typically the case. The main objective when pruning young medium- and large-maturing shade trees is to develop a dominant leader or trunk by shortening or removing co-dominant stems and clustered and competing branches. Clustered and fast-growing branches can form, including bark in the branch unions, which indicates a weak point on the tree. Clean the canopy by removing branches broken or badly damaged during shipping or planting. **Do not prune with flush cuts. See images below for more information).**

Little if any pruning should be necessary at transplanting if quality trees were purchased. Do not prune the plant to compensate for root loss. The latest research indicates that in most instances pruning does not help the plant overcome transplanting shock. Carbohydrates produced in leaves are needed for new root growth so the more leaves on the tree the better the root growth. If you feel that the top may die back from lack of irrigation after planting, and you would like to remove branches by pruning before they die anyway, then you purchased nursery stock too big for your irrigation capabilities. If you still feel compelled to prune field-grown trees at planting to compensate for root loose, reduce co-dominant stems or some of the lower branches that will eventually be pruned off anyway and perhaps thin the canopy. Do not randomly top the tree or round it over.

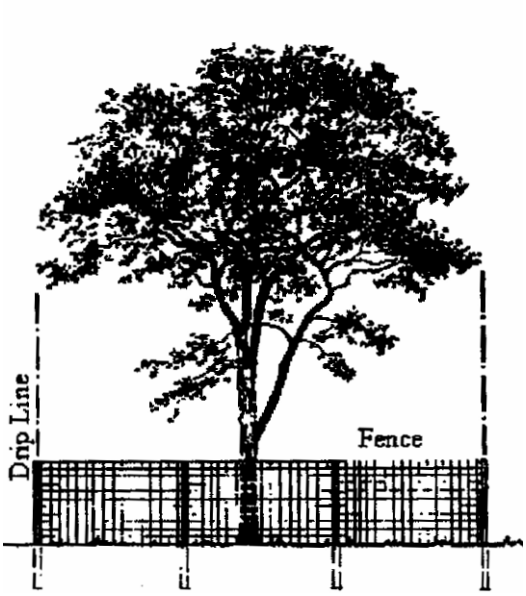
Pruning after establishment- If you are not familiar with the concepts of proper pruning it is not recommended that you prune trees. Not understanding proper pruning concepts can greatly affect the health and vigor of a tree and negatively affect the tree structure to where the tree can have branch and/or truck failure and death at a future time. It would be best to have a person experienced in proper pruning techniques to prune a tree if it is needed.

Usually the reasons to prune a tree are to remove dead branches (can do anytime of year) improve branch structure, to remove rubbing, damaged or diseased branches, and to help in proper tree structure like establishing one central leader. It is best to prune branches when they are small rather than when they grow large to help the tree heal (containerize) and grow over the prune wound. The best time to prune is generally during the late winter. Don't remove more than 1/5 of the crown in any given year. Make sure to disinfect pruning tools when pruning from one tree to another to minimize spreading fungal and viral diseases. Do not paint the pruning wound with any material, as the tree grows over the wound best without anything else.



Pruning a Small Limb

Screening Buffer Area Tree Protection



Preconstruction

A protective tree fencing, staking or continuous ribbon and all erosion control barriers should be installed prior to and maintained throughout the land disturbance and construction process to protect and call attention to the buffer area and should not be removed until final landscaping is installed (see image above).

A barrier fence, snow fence, orange plastic fence, welded wire fence, chain link fence, board fence, or chicken wire fence, or silt fence can be used to mark the buffer boundary before any clearing or grading operations are to begin.

All screening buffer areas are recommended to be designated as such with "Tree Save Area" or similar signs posted in addition to the suggested protective fencing, or staking. Signs requesting sub-contractor compliance with screening buffer standards is recommend for site entrances.

If you have other tree areas you wish to preserve through the construction process, using the root and tree protection suggestions in this section will greatly increase the probability of tree survival in the years following the completion of construction.

Land Clearing and Construction Operations along the Buffer Boundary

Clearing and grading operations should not be within 10 feet or the drip line (whichever is greater) of any tree to be retained or within any buffer area (see Root Zone Protection below for more information). Avoid grading (or adding soil) within the dripline of trees you are trying to save.

Trees being removed should not be felled, pushed, or pulled into tree screen buffer areas. Equipment operators should not clean any part of their equipment by slamming it against the trunks of trees to be retained.

Heavy equipment, vehicular traffic, stockpiling of materials, soil disturbance or compaction or deposition of sediment are not to be permitted within screening buffer area. These activities can block off air and water from roots. Lack of oxygen and water can cause tree roots to die, resulting in tree decline and/or death.

If trees need to be removed along the buffers edge, then trees with a well developed crown and trunk taper should generally be given preference over those with misshapen crowns or trunks, those with a small crown at the top of a tall trunk, or those with narrow, V-shaped trunk or branch unions.

Fires associated with land clearing and construction activities shall not be permitted within 125 feet from the buffer area, if the buffer contains existing or planted trees and shrubs.

By order of Virginia Forest Fire Laws if you are within 150 feet of anything that will carry fire to the woods, you need to stay with the fire until it is totally extinguished, which means there is no heat. Not seeing smoke does not mean it is extinguished.

Also, you need to carefully clear around the fire to prevent its spread before you begin burning.

In addition, if you are burning within 300 feet from anything that will carry fire to the woods, it is illegal to burn before 4 P.M. from February 15 through April 30th. (4PM Burning Law). During this period if you are within 300 feet of anything that will carry fire to the woods you can burn after 4 P.M. but you have to actively stop burning at midnight and stay with the fire until it is extinguished (if within 150 feet from something that will carry fire to the woods). See Virginia's Forest Fire Laws below or contact the local Department of Forestry office (540.967.3702) for more information.

Virginia's Forest Fire Laws:

10.1-1142.D. REGULATING THE BURNING OF WOODS, BRUSH, ETC.; Any person who builds a fire in the open air, or uses a fire built by another in the open air, within 150 feet of any woodland, brushland or field containing dry grass or other inflammable material, shall totally extinguish the fire before leaving the area and shall not leave the fire unattended.

10.1-1142A. It shall be unlawful for any owner or lessee of land to set fire to, or to procure another to set fire to, any woods, brush, logs, leaves, grass, debris, or other inflammable material upon such land unless he previously has taken all reasonable care and precaution, by having cut and piled the same or carefully cleared around the same, to prevent the spread of such fire to lands other than those owned or leased by him….

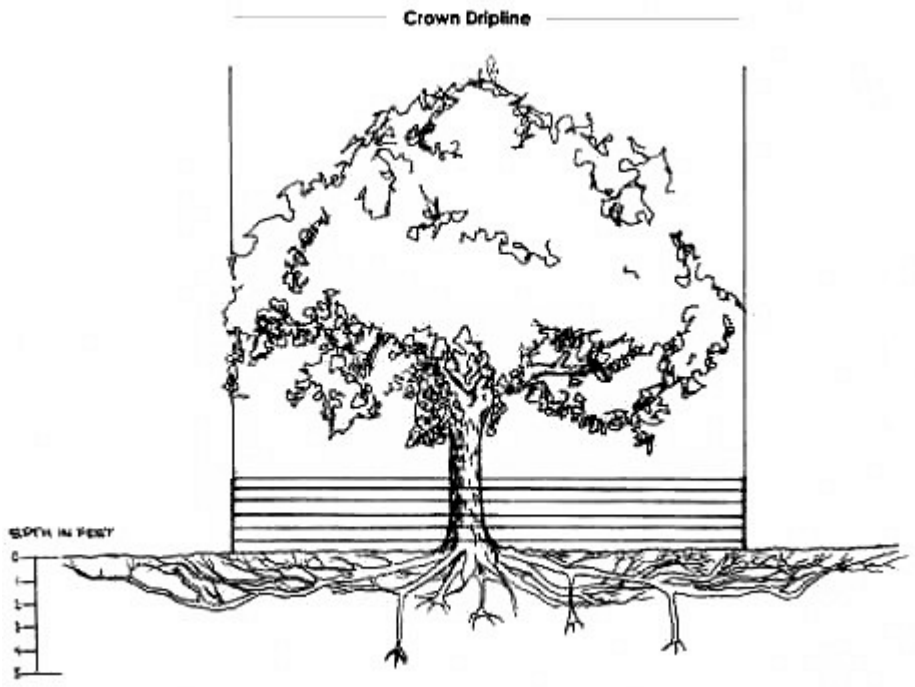
10.1-1142.B. During the period February 15 through April 30 of each year, even though the precautions required by the foregoing subsection have been taken, it shall be unlawful, in any county or city or portion thereof organized for forest fire control under the direction of the State Forester, for any person to set fire to, or to procure another to set fire to, any brush, leaves, grass, debris or

field containing dry grass or other inflammable material capable of spreading fire, located in or within 300 feet of any woodland, brushland, or field containing dry grass or other inflammable material, except between the hours of 4:00 p.m. and 12:00 midnight.

10.1-1142.E Any person violating any provisions of this section shall be guilty of a Class 3 misdemeanor for each separate offense.

Root Zone Protection

The root system within the dripline of a tree is generally considered to be the critical root zone. Try to protect these critical root zones within the buffer and along the buffer's edge. Keep soil disturbance and/or compaction away from the tree's dripline along the buffer's edge to greatly increase the probability of long-term tree survival following construction. Do not add or remove soil in this area. It is acceptable to use hand tools and small landscape equipment in this area but do not allow the use of heavy equipment if you wish to protect this important root zone area. Trenching should be minimized by locating several utilities in the same trench and should not be close to any tree trunk (the further away the better for tree survival). An alternative to trenching is tunneling, which causes less disturbance and mortality to the root system and lessens considerably the physical impact on the tree.



Raising the grade by placing fill over the root zone can retard the normal exchange of air and gases between the roots and soil. Roots may suffocate due to lack of oxygen, or be damaged by toxic gases and chemicals released by soil bacteria. Raising the grade may also change the water table which may produce intolerably wet conditions.

Lowering the grade more than a few inches (centimeters) may sever or irreparably damage a significant portion of both the structural and absorbing roots. Shallow grading results in the removal of top soil, leaf litter, understory vegetation and absorbing roots. The end result is a tree with the reduced capacity to absorb water and nutrients, and reduced stability against wind-throw.

Sources: Virginia Department of Forestry, Virginia Cooperative Extension, International Society of Arboriculture, USDA Forest Service, and Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida.

-October 2006-